TRANSACTIONS

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OF THE

MASSACHUSETTS

MEDICO-LEGAL SOCIETY.

VOLUME I.—NUMBER 9.

1886.

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THE "DUNBAR" CASE.[1]

BY F. K. PADDOCK, M.D., MEDICAL EXAMINER.

At 10.45 P. M., July 4th, 1885, I received notice that George S. Dunbar was found lying in Water street, Pittsfield, dead, with a wound in the back of his head. I immediately repaired to the place, and viewed the body at 11 o'clock P. M.

That part of Water street where the body was found is fifty feet in width, bounded on the south side by the Housatonic River, and on the north by a picket fence, back of which is a vacant lot. The street has no sidewalks. The travelled roadway is fifteen feet in width. On the north side of the roadway there is a space ten feet in width, extending to the fence, covered with grass. South of the roadway, the grass extends down the river bank twenty-five feet to the water. The street is unlighted at night, and the only building on that part of the street is the gas house.

The body lay parallel with the street, upon the grass between the roadway and the fence, with the head toward the east. When first discovered, the body was lying face downward; but it had been rolled over by the person who discovered it, and I found it lying upon the back, face upward. The night was very dark, and the view was made by the aid of lanterns. The body was warm; the face, back of the head, the adjacent hair, and the back of the neck, were discolored with fresh blood. The lids of the left eye were discolored and greatly swollen, presenting the characteristic appearance of a bad black eye, such as ordinarily results from a stunning blow upon the tissues covering the orbit.

At the back of the head, in the occipital region, just to the right of the median line, was a wound of sufficient size to admit of the little finger being passed through the skull into the brain, from which warm blood slowly oozed.

Lying beside the body, evidently on the spot occupied by the head before the body was turned over, was his hat, the brim of which was covered with blood, and there was a blood stained spot of grass under and beside the hat, where the blood had evidently trickled from the wound in the back of the head.

The body was dressed in a black cassimere suit. The coat was a loose sack, buttoned at the upper button. The examination of the pockets revealed the absence of his pocket-books and money. The pockets of the coat contained

[1] Read at the meeting of February 3, 1886.

only a white cambric handkerchief and three pistol cartridges, No. 32 calibre. His vest pockets contained a watch key and a cheap Waterbury watch, which was running. In his trousers pockets were a bunch of keys, and two or three blank gas-bills.

Upon the ground, close to the right ankle, as the body lay upon the back, was found a 32-calibre revolver, with five chambers; three of the chambers were empty, one contained a loaded cartridge, and the remaining one, an empty shell. To the handle of the revolver was tied one end of a piece of strong brown twine. This twine measured just ninety feet in length, and lay on the grass along the side of the roadway, the free end being about fifty feet from the body.

It was fastened to the handle of the revolver in such a way as to form a loop, which could be made to hold the hammer in a position half-way between half and full cock. When so placed, the weapon could be discharged by pulling on the string; this would free the hammer and allow it to fall. Experiments made with the revolver afterward showed that the cap of the cartridge would not explode every time the hammer dropped, but would average once in five or six times.

The chief witness at the view was a young man, who discovered the body as he was walking along the street, shortly after ten o'clock, on his way home. He first supposed the body to be that of a drunken man, and he called to two companions he had left upon the river bridge only a moment or two previously, to come to see who it was. One of them lighted a match and identified Dunbar. They then went to the gas-house, procured a lantern, and, accompanied by two employés at the gas-works, returned to the body, which they rolled over on to the back, and discovered that life was extinct.

A wagon was procured, and I had the body conveyed to his residence on Howard street. Before leaving the house for the night, I had a search made for Dunbar's wallets, in which he was known to usually carry considerable money, thinking that he might have left them at home when he went out that evening, but they could not be found.

The autopsy was made 10.15 A. M., July 5th, twelve hours after death, in the presence of Drs. J. F. A. Adams, Henry Colt, Jr., William L. Paddock, H. W. Dewey, and S. C. Burton. The body was well nourished and muscular, but without much adipose. Rigor mortis was well marked. The signs of injury were confined to the head only. The face was badly disfigured by the ecchymosed and swollen condition of the lids of the left eye. There was no other appearance of injury to the face. The blood was carefully sponged from the hair and scalp about the wound in the back of the head. The hair was not singed, nor could there be found any powder mark on the scalp. The wound through the scalp was round in shape, and a little larger than the opening through the skull. The edges of the scalp wound, as well as the bone forming the circumference of the opening through the skull, were blackened by lead which had been rubbed off from the bullet in passing through.

The calvaria was removed. The dura mater was found unusually adherent to the skull. In the posterior portion of the falx cerebri was a deposit of bone, shaped like a button, three-fourths of an inch in diameter, and one-eighth of an inch thick. The wound in the skull was irregularly round and situated in the occipital bone, one-third of an inch to the right of the median line, very near the occipital protuberance, just below the semi-circular ridge. The appearance of the wound indicated that the line of flight of the bullet was at right angles with that portion of the bone wounded. Several small spicula of bone were found in the lacerated cerebellum. The wound passed below the right lateral sinus, and extended upward and forward, through the posterior lobe of the right hemisphere of the cerebellum, through the posterior and middle lobes of the right hemisphere of the cerebrum, where, at the upper surface of the middle lobe, the wound changed its direction and passed downwards, forwards, and slightly inwards, and terminated in the anterior lobe of the cerebrum, close to the longitudinal fissure, where the bullet was found, in a position half-way between the anterior and posterior borders of the right anterior lobe, just above the right lateral ventricle. The brain substance was very much lacerated along the course of the wound. The left hemisphere of the brain was uninjured, and apparently in a perfectly normal condition.

The internal surface of the skull was searched with great care to discover any fracture that might have resulted from the concussion of the bullet, or from other sources, but none was found.

The bone was removed from the roof of the left orbital cavity, as well as the cribriform plate of the ethmoid in order to discover if there was any connection between the bullet-wound and the contusion or injury to the left eye. The orbital cavity was found full of clotted blood, which had infiltrated the cellular tissue behind and around the ball, pressing it forward as far as the optic nerve permitted. The cellular tissue of both lids was also fully infiltrated. There was clotted blood in the left nares, but the bone was found uninjured, and there was not any fracture extending from the wound in the occipital bone made by the bullet.

The bullet was very much flattened and its circumference was irregular and jagged, and presented the appearance of having struck the bone squarely on end; the base of the bullet was not bruised and exhibited the creasing marks of the barrel of the revolver and exactly fitted the empty shell found in the chamber of the weapon. The three cartridges found in the coat pocket exactly resembled those in the revolver.

The developments attending the view and the autopsy rendered the case problematical. Was it suicide or was it murder? Did this man shoot himself or was he shot by another? In order to intelligently consider these questions and properly weigh the evidence favoring the two theories, it is necessary that we should know something of the history of the deceased.

George S. Dunbar was born in 1836, in Pittsfield, where he lived until his death. His father kept a grocery store and a fish market. He was edu-

cated at the Grammar School. At the age of sixteen he was apprenticed to a mechanic and learned the machinist's trade. After attaining his majority and finishing his apprenticeship, he was employed in a woolen factory as machinist. He was married at twenty-eight years of age, and his wife kept the factory boarding-house, while he worked at his trade in the mill. At the age of thirty-three, he was appointed superintendent of the works of the Pittsfield Gas Company, a position he had ably filled for sixteen years at the time of his death. Soon after receiving the appointment of superintendent, he bought a house on Howard street, near the gas works, where he has since lived. Physically he was strong, vigorous, and very active. Although rather spare in form, he was muscular and possessed great endurance. He never had any severe illness, with one exception, and that was a temporary attack. On several occasions he had been overcome by the inhalation of illuminating gas, while at work in an excavation endeavoring to find a leak in the gas pipe. About four years ago, he was carried home in a paralyzed condition from this cause, and for twelve hours afterward, he was delirious and had several severe convulsions, during which opisthotonos was well marked. He recovered in forty-eight hours and was at work again.

His duties as superintendent were arduous. Leaks in the gas-pipes, in various parts of the town, as well as the locating and laying of new pipes, he attended to. The monthly and quarterly record of the numerous meters, he took himself, besides making out and collecting a great many of the bills.

He was in the habit of carrying with him in a large wallet a considerable amount of money, varying from fifty to two hundred dollars, which he took no pains to conceal, and exposed it freely whenever he happened to be about town when making change, as he collected the gas bills. He was called upon by everybody in town using gas, to correct any fault found with the illuminating vapor. The prompt fulfilment of all these duties demanded constant activity early and late, and Mr. Dunbar was always equal to the emergency. He was strictly temperate and scrupulously honest in all transactions. However trying or vexatious were the demands and whims of unreasonable gas-takers, he always appeared cheerful and unruffled, and faithfully endeavored to relieve the cause of dissatisfaction. He had a pleasant home and a happy family, consisting of a wife and four children. His salary as superintendent was more than sufficient to support them comfortably, and he was able to save a small amount of his annual income. Some eight years ago, he and his brother bought some stock in Wall street, not as a speculation at first, but as an investment. In the course of a few years, however, they became somewhat familiar with the stock-market and were more or less infatuated with the excitement and the possibilities of dealing in stocks, and they began to speculate, at first carefully and successfully, so much so that when the brother died of cerebro-spinal meningitis in 1881, they were reported to have made between twenty and forty thousand dollars. It is a singular if not a significant fact, that George's death occurred on the fourth anniversary of his brother's death. It is not known that George met with any serious losses, subse-

quently, until the spring of 1884, when, by an unfortunate and unexpected change in the price of stock which he had bought on a margin, he lost all that he had made; and it is supposed that he also lost a small amount that he had borrowed. For the fifteen months following this reverse there is no evidence that he dealt in stocks at all, and in April, 1885, he settled with his broker in New York and withdrew the balance of his account. He did not allow his interest in stocks to interfere with his duties as superintendent of the gas company. The business was carried on by telegrams through brokers in New York. He developed a considerable degree of ingenuity in the line of his business as superintendent. He made several practical inventions, one of which is very successfully used for lighting and another for extinguishing the street lights at night. Within the last five years he has paid considerable attention to life-insurance as an investment. As soon as it was discovered by insurance agents that he was interested in the subject, he was beset by representatives of various companies. At first he stated that he wanted insurance to the amount $25,000. He got $21,000 in regular life-insurance companies, but finally several declined to insure on account of his having had convulsions after inhaling the illuminating gas. This seemed to annoy him and induce him to seek insurance in companies and mutual benefit associations that were not so particular about their risks, and he ultimately secured $66,000 of insurance, divided among various companies, associations and fraternal societies.

Several times he noticed that he was followed by one or more ill-looking men, as he made his rounds of observation of the burning of the gas at night, as he walked through the back streets, and he mentioned the fact to the officers of the gas company. They cautioned him about exposing his money so freely when he had occasion to make change on the street, and advised him to carry a pistol. He replied that he was not afraid, that he never carried a pistol, and he disliked to do so. At the inquest there was no evidence to show that he ever carried one, except the testimony of a hardware merchant, who stated that he had sold him a revolver last April, similar in pattern to the one found by his body; but on subsequent examination by the judge, he and his clerk made such conflicting statements that the court was led to believe that the merchant did not sell him the revolver found by the body, although he may have sold him a different one. His family knew that he owned two revolvers, and they were both found in his house in their usual places after his death.

I speak quite confidently of Mr. Dunbar's character and habits, because I had known him rather intimately for fifteen years. Our offices were on the same floor of the same building and adjoined, so that, in addition to my knowledge of him as his family physician, I saw him nearly every day as he was about his business. At the time of his death he had an annual income of between three and four thousand dollars, which was more than enough to comfortably support himself and family. His assets, as near as could be ascertained at the inquest, were $18,170, while his indebtedness was $22,200, making a

difference of about $4,000, which he owed for borrowed money. This amount with his good health and regular income could hardly have caused him especial anxiety, or have been the cause of despondency.

The day preceding the evening of his death was spent apparently as usual, and he went to his home about six o'clock, P.M., and reclined upon the sofa during the evening, the time being occupied in reading and in conversing with his family. Between half-past nine and ten o'clock he left the house, saying that he was going to investigate a reported leak in the gas-pipe under the Elm-street bridge, near where his body was found shortly after ten o'clock. In fact, he was seen by several people walking in a direction which he would naturally take in the night to go to this bridge; but whether he had been there and was returning by the gas-house when he met his death, or was on his way to the bridge when it occurred, is unknown.

The inquest was held by Judge Tucker, beginning a few days after the death of Dunbar, and continued for several weeks. Every person was examined, who, it was supposed, could throw any light upon the cause of death, whether theoretical or practical.

Among the medical examiners called to testify, was Dr. D. B. N. Fish, of Amherst, whose investigations regarding powder-marks upon the skin, in the event of bullet-wounds from pistols held near the body, rendered his experience and experiments of value, in determining the question of possibility of a person shooting himself as Dunbar was shot, with the revolver found by the body, without exhibiting powder marks on the hair and scalp about the wound. The inquest was conducted with care and perseverance, but nothing in the testimony positively indicated the precise method of the shooting. Several detectives were employed, who very soon came to the conclusion that it was a case of suicide. One of them discovered a mark or crease across the sole of the right shoe which Dunbar wore when found, that might have been made by the twine that was attached to the handle of the revolver, indicating that the twine had been drawn tightly across the sole of the shoe with the left hand, while the right hand held the weapon in position for firing. Dr. Fish testified that, without using the twine, the revolver could possibly be fixed and fired twenty-six inches from the head so as to make a wound like the wound in Dunbar's head, without producing any powder burn or mark upon hair or scalp.

Three days after Dunbar's death, his wallet and pocket-book were found just across the unoccupied field, on an ash-heap, back of a store-house, about thirty-six rods from where the body was found. They contained no money; one of them was open and the other closed, with its strap tucked into the loop.

The testimony of the medical witnesses differed in regard to the cause of the extensive ecchymosis of the lids of the left eye and the effusion of blood about the ball. All but two thought it could only be accounted for by a severe blow upon the eye. Two, however, considered it possible to have resulted from the blow or shock of the bullet upon the back of the head, al-

though there was no fracture of the base of the skull or any injury whatever to the bones entering into the formation of the orbital cavity.

The judge's report of the inquest was very elaborate and complete, consisting of over twenty-six pages of legal cap. In conclusion, he says:

"It seems clear that the death was either a murder, with an attempt to make it appear to be a suicide; or a suicide, with an attempt to make it appear to be a murder. A careful consideration of all the facts compels me to the conclusion that Mr. Dunbar committed suicide. This theory explains all the facts but one; this exception is the injury to the left eye. The evidence leaves it doubtful whether this injury was inflicted by a blow or was the result of the shock of the bullet-wound. If the latter theory is true, then it is not inconsistent with suicide: if the former, then suicide seems impossible.

"I find and certify that George S. Dunbar of Pittsfield, Massachusetts, shortly after ten o'clock on the evening of July 4th, 1885, on Water street in said Pittsfield, came to his death by a bullet fired from a pistol, which bullet entered the back of his head, and that said pistol was discharged by his own hand.

(Signed), JOSEPH TUCKER.
Justice of the Central District Court."

The absence, at the inquest, of more positive evidence of murder, renders, of course, the finding of suicide justifiable. Yet there are circumstances connected with the case that seem to point quite positively to the conclusion that Dunbar did not shoot himself:—

(1) The black eye is incompatible with the theory of suicide.

(2) The situation and direction of the wound indicate that the revolver must have been held in a position almost, if not quite, impossible for the hand of the person shot, without causing powder marks or burns upon the hair or scalp.

(3) The fact that the pocket-books were found empty in a locality where they would naturally have been examined and left by a thief who had committed a murder and escaped through the field adjoining, a place where sufficient light could be obtained to examine the booty without being seen. If Dunbar had himself left them where they were found, he would, to escape observation, have travelled a long circuitous route from the place where he was last seen.

Besides these, there are other circumstances that might be mentioned, which militate against the probability of suicide. If he committed suicide he evidently meant to have it appear to be a murder. Upon no other theory can the long string, the fact that he was shot in the back of the head, the placing of the pocket-books, and the locality selected for the deed, be accounted for. If such was his intention, then an alert, intelligent and ingenious man, in the full possession of his faculties, laboring under no especial excitement, carefully prepared and carried out his scheme in the most bungling

and foolish manner. Why should he have attached a useless string, ninety feet long, to the revolver and left three cartridges in his pocket? On the other hand, if he was murdered, these evidences of suicide are just what would have occurred to his assassin, to throw off the suspicion of murder. Which of the two theories is the true one, time may fully reveal.

If he committed suicide it is improbable that any further evidence of the fact will ever be added to what is now known. If he was murdered, there is yet hope of the discovery of the assassin.

THE DUNBAR TRAGEDY: WAS IT A MURDER, OR WAS IT A SUICIDE?[1]

BY D. B. N. FISH, M.D., MEDICAL EXAMINER.

THIS case came under the observation of a medical examiner in a county adjoining mine, and my interest in it arose from facts learned by me during attendance at the inquest.

If, in the view here taken of it, I differ from some of my medical brethren, it is done in no spirit of criticism, for I realize the fact that it will probably never be determined by positive evidence whether this was a suicide or a murder, and that every one who forms an opinion will do it from his estimate of the probabilities in the case.

About ten o'clock on the night of the 4th of July, when the sound of a pistol-shot would attract little attention, a man was found upon a side street of a populous town, lying on the ground; the face rested on its left side, the body on the chest and abdomen. At first it was thought he was drunk; soon it was found that he was dead. On examination, a bullet-wound, which was apparently the cause of death, was discovered in the back of his head.

At the autopsy it was demonstrated that "the bullet had entered the head just under the occipital protuberance and just to the right of the median line. The skull was splintered at the point of entrance of the ball. The bullet had passed from the point of entrance upward and forward, and slightly to the right, till it reached a point a little forward of the middle of the skull, from one inch to one inch and a half, to the right of the middle line; then it passed downward, forward, and to the left at quite a sharp angle, and was found in the brain substance over the sphenoid bone, about one and a half inches from the forehead. The skull at the point of entrance was very thick, solid and fine-grained. The left hemisphere of the brain was perfectly normal. The socket of the left eye was found to contain a large clot of blood. It was impossible that the bleeding caused by the bullet should have reached the socket of the left eye. The lids of the left eye were infiltrated with blood and the eye protruded from its socket. There was clotted blood in the left nares. There was no other mark of violence. The hair was not burned nor singed, nor were there any marks of powder on the scalp, the skin or the clothing. There was no abrasion of the skin about the eye or on the face. It was the opinion of all the physicians present at the autopsy that the injury to the eye was caused by a blow on the eye." It was thought that there was no fracture of the sphenoid, ethmoid or orbital plates. The right eye was normal.

[1] Read at the meeting of February 3, 1886.

Near the body, about three or four inches from the right ankle, lay a revolver of a pattern called the "Defender," calibre-32, long; this held one metallic cartridge — a 32, short — and one empty cartridge-shell. To this revolver, by a peculiar arrangement which will be described further on, was fastened a strong hempen string, ninety feet in length. This string, or cord, passed under the right foot and was stretched out along the road for about fifty feet; it was attached to nothing but the weapon. In the left pocket of the coat were three cartridges similar to the one in the pistol. The coat and vest were buttoned. The two pocket-books usually carried upon the person were missing.

From the stand-point of the medical examiner was this a murder or a suicide?

The entire absence of powder-marks, the location of the wound of entrance, the course of the ball through the brain, and the absence of the pocket-books would seem to point to the probability of murder, while the ninety feet of string was a mystery in any view of the case. The arrangement of this string can be reproduced in the following manner: Tie a long cord, about six inches from one end, around the handle of a pistol, just back of the hammer and trigger, with a hard knot directly underneath the pistol; bring both ends of the string up over the hammer and tie in a hard knot directly over the hammer; pull the string back till it slips off the hammer, and the string, with its loop, will be seen as it was found on the "Defender." This loop could not be passed over the trigger and used for firing.

That this pistol was fired within the ordinary suicide limit is disproved by the absence of the scorchings and brandings of the powder, unless it can be shown that some intervening substance had been used, or that it is possible to hold a pistol so closely to the head that no marks of the powder would be seen. One witness stated that a hat was found pressed well down upon the back of the head; others said the hat was on the ground near the body. This hat was missing soon after the tragedy, and was admitted to have been burned by a member of the family, but the medical examiner had assured himself that there was no bullet-hole in it, nor powder-marks on it. I do not believe it possible to fire a pistol so closely to the head that some of the gases will not escape and burn the hair, but if this were possible, some unburned powder would follow the ball into the brain. No grains of powder were found in the wound, and the conclusion is obvious that this shot was fired beyond the limit of the powder-marks. It would seem impossible that one could hold a pistol at such a distance, and fire it so as to send the ball into the back of the head with the upward and forward direction seen in this case. Professor Maschka, of Prague, is quoted, in the *Medico-Legal Journal*, September, 1885, page 228, as laying down the following rule: "Certain well-known appearances, such as burning, singeing, dark discoloration, and hardening of the parts close to the wound, *must* be present for a theory of suicide." This positive statement, taken in its full apparent meaning, would leave no ground for the further discussion of this question; but Caspar has shown that suicides sometimes arrange for shooting themselves at a distance, by means of a string attached to

the trigger of a pistol, and I hope to prove that it is possible to shoot one's self with a pistol held in the hand at a distance beyond the limits of the powder-marks.

The black eye, with the extravasation of blood into the orbit, was considered the result of a blow over the eye, and, therefore, evidence of a murderous assault. The three cartridges in the pocket might have been placed there by a murderer to excite a suspicion of suicide, while the absence of the pocket-books seemed to indicate murder and robbery, rather than suicide.

What did the ninety feet of string mean? In the hands of a confederate, it might have served as a means of signalling that the way was or was not clear; or it might have been used to pull away the pistol after firing, in order that no weapon be found upon or near the murderer, should he be apprehended immediately after the shooting, or should miss his aim, or should be discovered and suspected before firing. It was not possible that the pistol had been fastened to the fence or the telegraph pole near by, and then fired by means of the cord by the man himself, for the blood from the bleeding wound of the head had not run down his body or his clothing, as it would have done had he removed any fastening of the cord or pistol after the fatal shot.

The hour and the place were each alike favorable for murder or for suicide. But if this was a murder, what was the use of the peculiar loop of the string on the pistol? By pulling back the hammer, the loop could be slipped over it and used to fire the pistol. The "Defender" has its half-cock so far back that such a loop will slip off the hammer just before it reaches the half-cock, and thus the hammer can be snapped down on the cartridge; but the force of the blow is so slight, that a cartridge can be fired only after repeated attempts. It is not credible that a murderer would use such a clumsy contrivance for firing, for the repeated snapping down of the hammer on the cartridge would be too much like sounding the burglar-alarm before attempting to break into a house.

It was suggested that the string might have been passed under the foot, and the pistol have been fired by the man himself, using the loop over the hammer. This also could be done, and the firing done with some degree of accuracy. Would any use of such a string enable one to hold and fire a pistol, with any degree of accuracy, at the back of the head, and this at such a distance that the powder-marks would not show? From former experiments of my own with revolvers similar to the one used, and from the teachings of the authorities, it seemed necessary that this pistol, with its .32-short cartridge, must be held at least twenty inches from the back of the head to be sure of escaping powder-marks upon some part of the head or neck (a conclusion which subsequent experiments with a "Defender" appear to verify); yet I was obliged to admit at the inquest that I could not then, either with or without the string, hold a pistol aimed at the back of the head at a distance greater than nine inches, and at this distance could not be sure of my aim. But later observation and experiment showed me a method of holding the muzzle of a pistol at even thirty inches from the back of the head with an

almost absolute accuracy of aim. Held in such a way, the pistol could be fired by the use of the loop over the hammer, and the string under the foot without using the trigger, but this gave no advantage either in holding or firing the pistol, for it could be fired easier and more accurately by using the trigger alone. After experimenting for a week, I pulled the loop back and well down on the butt of the pistol, and used the string under the foot as a "guy-rope" to steady the weapon. The latter was cocked and held in the right hand at arm's length, with the muzzle pointed towards the head — somewhat as one holds a pen. The butt rested on the little finger, the handle was grasped firmly between the other fingers and the thumb, and the trigger pressed against the palm of the hand. Held in this way, a contraction of the hand, so slight as to be hardly noticed, would fire the pistol. This method of using the string furnished a rest for the weapon, and its great advantage was at once apparent. The aim would be made certain by aiming the revolver at the right eye, and then turning the head half-way round. The cord would keep the hand from moving.

Here, then, is a possible method of firing the pistol with great accuracy at the back of the head, from such a distance that the powder-marks would not show, and a method reasonably accounting for the use of the loop and string. All that seems necessary to establish the probability of this use of the cord is some evidence of such use. The shoes found on the body were worn, and apparently had been recently wet. On the sole of the right shoe (under the instep), and on the left side of the shoe, were creases which can be exactly imitated by steadying a pistol with a cord in the manner above described, held between the thumb and fore-finger of the left hand. There was no crease on the outer or right side of the shoe.

Perhaps it will not be out of place to say here that it was the sight of the loop on the cord and the creases on the shoe which led me to change my belief in the murder theory to the conviction that this was a suicide, although I could not then account for the absence of the powder-marks. I do not believe that these creases, so exactly like those appearing on my own shoe after using the cord in the way I have described, were accidentally caused by pulling on the string at the time of finding the body; the pistol would not furnish resistance enough to make so well defined a mark as was found on the bottom of the shoe.

Was there anything impossible or improbable in the location of the wound, or in the course taken by the ball, provided the pistol had been held and fired in the manner described? A pistol can be aimed and fired so that the ball will strike any given point in a line from the eye to the occipital protuberance. It could be so fired that, if the ball continued its direction after striking the skull, it would make a wound similar to the one found in this case, but to do this would require a position of the head and arm that would be unnatural and strained, and therefore improbable, because there could be no conceivable advantage in trying to give such a course to the bullet. The easiest and most natural method of holding a pistol, aimed at the right

side of the back of the head, would send a ball from the right to the left side of the brain provided it was not deflected from its course. A conical ball, fired within a short distance, from a first-class revolver of medium size, will, as a rule, pass into and through the brain in a direct course, but military surgeons have recorded many exceptions to this rule.

This bullet was apparently fired from a very inferior weapon, the "Defender," many of which, like its class, will often, I may say generally, throw a ball so that it will strike wholly or partly on its side rather than on its end, and thus may make a large wound of entrance, although fired within a few inches of the head. When such a bullet strikes a rounded and unequally resisting surface, like the region of the occiput, it will be very easily deflected. Considering these facts, it seems very probable that the weapon was held in the more natural position, while the ball, deflected from its original aim, took the course described. At any rate, the location of the wound and course of the bullet do not need a theory of murder to account for them.

I do not believe the condition of the left eye was necessarily the result of any murderous assault. Black eyes, as the result of accident, are so common, and the possibilities of accident in this case so great, that I believe the condition of the left eye might be safely ignored. It was thought by some, as I have said, to have been caused by a blow over the eye, inflicted by the murderer before the shooting, and was held to be one of the stronger evidences of murder; but this seemed to me improbable even when I believed in the murder theory. If it could have been caused by a murderer's blow, so slight that it left no mark upon the face, it might equally well have been accidentally self-inflicted; or might have been caused by striking a stone or lump of earth on falling after the shot; or the men who first discovered the body and thought it that of a drunken man may have accidentally struck the toe of a boot against the eye before life was fairly extinct. Any of these things were possible, and, in my opinion, far more probable than the theory that it was a second wound inflicted by a murderer. To adopt the latter theory would be doing great injustice to a very skilful piece of work. If this was a murder it was done in accordance with a preconceived plan to make it appear a suicide, as shown by the use of the pistol of the victim (or at least one like it), by the string and its mark on the shoe, and by the cartridges in the pocket. A man capable of planning and executing such a master-piece would be very careful not to furnish gratuitous evidence of murder by inflicting an unnecessary wound of the eye, either before or after the shooting.

But there is another possible explanation of the condition of the eye which seems to me the most reasonable one, and this is that the extravasation of blood about the left eye was a part of the injury caused by the bullet. Ecchymosis of the lids with extravasation into the orbit of one or both eyes often occurs during whooping-cough, and has been seen after excessive vomiting. It is not infrequent after gun-shot wounds of the head, and has even been observed after a fall upon a carpeted floor. I have found but little written on the subject of "black eyes" from gun-shot wounds, and must con-

fess that I find no record of a case exactly parallel to this in which the effusion of blood appeared upon that side alone which was apparently uninjured. In the "Medical and Surgical History of the War,"[2] are recorded several cases in which ecchymosis of the lids was noted. Among these is the case of an unknown soldier (page 204), who was found "with a penetrating fracture of both tables of the left parietal bone at the anterior superior angle . . . the right eyelid (was) ecchymosed. A puffy swelling existed in the right temporal region . . . death ensued the same evening." In the absence of any record of autopsy it cannot be known what, if any, injury was done to the right side of the head by the ball, but the case is of interest as showing the absence of ecchymosis of the eyelids on the side known to have been injured, and its presence on the other or right side.

Lieut. Lilycrantz (page 193) "was wounded by the discharge of a pistol at a distance of about four feet from his head. The ball perforated the os frontis over the right supercilliary ridge. . . . A probe, five inches long, glided easily, by its own weight, its full length directly backward through the wound without coming in contact with the ball. . . . There was considerable extravasation in the cellular tissue of the eyelids and the pupils were dilated." In this case the ball penetrated the *right* side of the brain while the lids of both eyes were ecchymosed.

The case more nearly parallel to the one under consideration is that of President Lincoln (pp. 305, 306). The ball entered the head "about one inch below the superior curved line of the occipital bone and an inch and a half to the left of the median line of the same bone. . . . Over the left eyelid there was slight ecchymosis." This was followed by "excessive extravasation into the orbits, accompanied by great ecchymosis of the eyelids." At the autopsy it was found that "the ball entered through the occipital bone about one inch to the left of the median line and just above the left lateral sinus which it opened. . . . It then penetrated the dura mater, passed through the left posterior lobe of the cerebrum, entered the left lateral ventricle, and lodged in the white matter of the cerebrum just above the anterior portion of the left *corpus striatum*, where it was found." This was about six inches from the entrance wound. "The ventricles of the brain were full of clotted blood. A thick clot beneath the dura mater coated the right cerebral lobe. There was a smaller clot under the dura mater of the left side. . . . Both the orbital plates of the frontal bone were fractured, and the fragments pushed up toward the brain. The dura mater over these fractures was uninjured. The orbits (were) gorged with blood." In regard to this fracture of the orbital plates, Dr. Otis quotes, with approval, the opinion of Prof. T. Longmore, of Netley, from which I make the following extracts: "The ball did not strike the anterior part of the cranium yet the orbitar plates of both orbits were found to be the seats of comminuted fracture. . . . This double fracture was decided to have been caused by coutre-coup. If the term coutre-coup be limited to its precise signification of counter-stroke, that is, the impression made by

[2] Part I. Surgical Volume.

the stroke on the part of the cranium opposite to that directly struck by the ball, will the force of coutre-coup explain the fractures in this instance? . . . I am inclined rather to attribute the lesions mentioned to a transmitted undulatory stroke or sudden impulse of the brain-substance itself, against the thin bony layers constituting the orbitar plates." "The unusually thin orbital plates on either side," says Dr. Otis, "were exposed to the impulse of the cerebral pulp. Even if they were not fully protected by the dense supra-orbital ridges, it might be inferred that the force would be transmitted mainly to the right orbital region, or that opposite the entrance perforation. Whereas *both* orbital plates were fractured. That the fragments inclined upward toward the brain rather than downward and forward, was probably due to the pressure of the blood extravasated within the orbits."

It will be remembered that in the case which forms the subject of this paper, the ball struck against the right side of the vault of the cranium and was deflected sharply towards the left hemisphere of the brain. If the medical examiner had not assured himself that there was no fracture of bone at any point other than that of entrance, the condition of the left eye might have been easily accounted for on the theory that the force of counter-stroke, or if, with Dr. Otis and Professor Longmore, we reject this, the impulse given by the ball to the cerebral pulp had fractured the sphenoid, or the orbital plate of the left, if not of both orbits. It is possible that the effusion of blood appeared first in the left eye because of the position of the body, and that it might have appeared later on in the other had it not been checked by the advent of death. It will be remembered that in the case of President Lincoln, who lived nearly nine hours after the receipt of his injury, the ecchymosis appeared first over one eye, while *both* orbital plates were broken. If, in the case under consideration, we must exclude any fracture of bone, can we not safely admit the possibility that the impulse of the bullet upon the brain-substance may have ruptured some minute branch of the ophthalmic artery and thus caused the hæmorrhage?

Having shown, as I think, that every feature of the injury to the head could be produced by a suicidal shot, it is time for an estimate of the probabilities of the case. I cannot see an objection to the suicide theory that does not bear with equal weight against the theory of murder. The former seems consistent in all its parts, while the latter seems inconsistent and in some of its requirements apparently impossible.

On the theory of suicide this man, who was known to be possessed of remarkable ingenuity, who had a few months before purchased a pistol and cartridges similar to those found on the body, who is reported to have asked when buying the pistol: "where can a man shoot himself to cause instant death?" and to have been told "in the back of the head;" — this man determines to commit suicide, and to do it in such a way as to make it appear a murder. He arranges the string on the revolver in such a way that he can shoot himself from a distance that will excite a suspicion of murder, not necessarily knowing that he could fire it beyond the limits of the powder marks.

He loads his pistol with two cartridges and puts three in his pocket. He starts out and is seen on the street, but suddenly disappears from the road, or, rather, is not seen to pass a house a little further along his route; he has turned off the road to leave his empty pocket-books, folded and clasped, in plain view in the rear of a building. Perhaps he here receives an accidental injury to the eye. He then goes down to a less frequented street, drops the loose end of the string and unwinds it as he goes. Now he cocks the revolver, holds it directly out from the shoulder at arms' length, adjusts the cord and makes it taut by an almost involuntary up-and-down movement of the hands which causes the cord to crease his shoe, takes his aim by the starlight, for it was starlight, or possibly by the phosphorus from a match rubbed on the top of the barrel and sight of his pistol, turns his face over the left shoulder, presses the palm of his hand against the trigger and the deed is done.

I have been told that this scheme is too ingenious to be credible, but *somebody* thought of this method of using the string before the officers of the law came upon the scene, and if that somebody was a murderer, he had a plan which involved all this and much more. This murdered man must appear to have committed suicide, but there must be evidence on and about the body to make it appear that he had endeavored to simulate a murder. The pistol of the victim by his side, the string with its loop, the buttoned coat and vest, and the creases on his shoe (to be made after the man had fallen), will excite a suspicion of suicide, while the absence of the powder-marks will indicate that he has attempted to simulate a murder by shooting himself at a distance. How much more simple and safe to have placed the weapon to the man's head and fired. His own pistol by his side, the three cartridges in his pocket, and the buttoned coat and vest would have pointed strongly to suicide.

I have not introduced here the supposed blow upon the eye, for I do not see where, in the theory of murder, it can come in with any degree of propriety. No man holding a loaded revolver in his hand, with the intent to shoot his victim in a comparatively public place, would first knock him down, and then stand off and shoot him from a distance. If this was a murder, the assassin, after taking incredible pains to make it appear a suicide, would never have placed the empty pocket-books where they could be easily found, and thus, by his own act, arouse a suspicion of murder.

If we adopt the theory that this was a murder, with no attempt to make it appear a suicide, we have to account for the pistol owned by the victim, for the loop on the string, for the creases on the shoe — so unlikely to have been produced by accident — for the buttoning of the coat and vest at the risk of safety, after rifling the pockets, and for the folding and clasping of one, at least, of the pocket-books after taking what little money might have been in them.

I believe that the medical examiner would have been justified in reporting this as *a case of probable suicide, but one which demanded a legal investigation.*

At the inquest it was shown that the deceased was in straitened financial circumstances, and that he had an insurance on his life of $66,000.

In his summary of this case, Judge Tucker said: "It seems clear that this death was either a murder, accompanied by an attempt to make it appear a suicide, or a suicide with an attempt to make it appear to be a murder. A careful consideration of all the facts compels me to the conclusion that Mr. Dunbar committed suicide. This theory explains all the facts but one — that exception is the injury to the left eye. The evidence leaves it doubtful whether this injury was inflicted by a blow, or was the result of the shock of the bullet-wound. If the latter theory is true, then it is not inconsistent with suicide; if the former, then suicide seems impossible."

It hardly seems probable that the judge intended to exclude the *possibility* that the injury to the left eye was caused by accident, and when he says: "If the former theory — that this injury was inflicted by a blow — is correct, then suicide seems impossible," I must suppose him to mean a blow from the hand of an assassin.

The verdict was that Mr. Dunbar "came to his death by a bullet fired from a pistol, which bullet entered the back of his head, and that said pistol was discharged by his own hand."

NOTES ON THE LAWTON MURDER.[1]

BY WILLIAM H. TAYLOR, M.D., MEDICAL EXAMINER.

On December 23d, 1885, at 9.30 o'clock, A.M., I was notified that the body of a man was lying in a wagon at Plainville, about three and a half miles from New Bedford, and that the surroundings indicated a violent death. As soon as possible I went to the place, arriving about ten minutes after ten, and found an express wagon, furnished with sideboards, drawn up to the wall at the north side of the road. This road, followed west, leads to Fall River, and in its easterly course passes through the towns of Acushnet, Rochester, Marion and Wareham. The wagon was a brown one with yellow trimmings and red wheels. The dashboard, footboard, thill, axletree, whiffletree and wheel on the right side were plentifully covered with recently dried blood. On the tailboard were two bloody smooches as though produced by bloody hands in closing the board. The board which ordinarily served to increase the height of the tailboard was missing, and was afterward picked up on a road in Rochester. The hind axle was badly sprung. Attached to the wagon was a dark chestnut horse with sweat dried on him, and evidently weary and hungry. The wagon contained a dozen or so of wood-colored boxes of the capacity of half a bushel each, and having the name "Lawton" on them in stencil. Seven of these boxes were closely stowed in the forward part of the wagon and contained eggs, one of the eggs being broken. The balance of the boxes were empty, and were piled helter-skelter on the body of a man which was lying diagonally across the floor of the wagon, the head to the right near the tailboard, and the feet projecting five or six inches over the left sideboard, well forward. Before the removal of the boxes, it was noted that the wagon contained a small Japanese wolf-robe (lined with brown cloth and smooched with blood which had evidently undergone attempts at removal) and a horse-blanket, red and white checked, old and worn. A number of the boxes having been removed, the body came into view. It was that of a man thirty-five to forty years of age, rather below the medium height. The left side of the face was covered with dried blood into which dirt, and a few small, dry, brown leaves were matted, the leaves resembling those of the box-shrub. Numerous wounds were seen on the left side of the face, five being of special prominence.

At the back part of the head a wound was found from which blood was oozing on the bottom of the wagon. The body was not quite cold. Rigor

[1] Read at the meeting of June 8, 1886.

mortis was observed in the legs only. About the neck was an old tarred hemp line as large as an ordinary clothes-line, which was tied in a "granny" knot on the right side, and had the appearance of being doubled. This rope had a long free end, and exercised no constriction on the neck. The clothing consisted of a brown mixed overcoat, blue undercoat, red cardigan jacket, dark vest, white shirt and paper collar, gray-mixed trousers, underwear and stockings and black cloth boots, quilted. On the hands were brown leather gloves, well worn and bloody. All the clothing was blood-stained except the cardigan jacket, underclothes, stockings and boots. The boots were not muddy, nor was there any mud on the clothing except a spot on the back of the overcoat where it had laid on the floor of the wagon. (The day was warm for December, and the roads were muddy). In the pockets were found a cigar, a few matches, a white handkerchief and a few worthless coins, but not a cent of current money. The inspection having been completed the body was arranged in the wagon and the whole affair was sent to the morgue in New Bedford under charge of a policeman. The body was identified on the spot, by a gentleman who well knew deceased and his habits, as that of Richard N. Lawton, of Westport, Mass., by occupation a collector of eggs in the towns of Wareham, Rochester and Dartmouth. He gave valuable information as to Lawton's probable whereabouts at the time of the murder, judging from the quantity of eggs which the wagon contained, and also stated that money in some quantity should have been found in the pockets. Inquiry along the road developed the fact that several persons had seen the wagon go by at daybreak, and almost all stated that the driver was a shortish man, with a black or dark mustache. This information, collected on the spot, probably assisted greatly in the speedy arrest of the criminal. A case of murder and robbery with subsequent transportation was readily made out.

An autopsy was held at 4.05 P.M., December 23d, at Wilson's morgue. After calling attention of witnesses to the position and appearance of the body as required by law, the examination proceeded. The body was that of a well-nourished and muscular man, five feet six inches tall, and would weigh about one hundred and thirty pounds. Very little rigor mortis, if any, was present. An evacuation of the bowels of ordinary appearance had occurred. Clothing was as before described. Subject had a brown mustache, and brown curly hair with a tendency to baldness at the forehead. A piece of tarred hemp line was removed from the neck. It was eighteen feet long, and had a standing bowline tied in the end giving the appearance of a double rope around the neck. The knot was situated just to the right of the median line of the chin, and, upon testing it, the rope did not slip. Three fingers could be easily passed between the rope and the neck, and no furrow could be found on the skin indicating constriction. No marks of violence could be found externally, except upon the head. Post-mortem ecchymoses were slight. Blood was dried in the ears, nose and mouth. The left side of the face was covered with dried blood containing dirt and a few

small leaves. There were ecchymoses under both eyes. At the back part of the head on the right side near the median line, three and a half inches from the margin and just below the level of the top of the right ear, was a wound one inch by three-quarters of an inch with ragged margins, from which blood oozed. On washing the face, no powder-brand, burnt powder, or traces of wadding could be found. No wadding was found about the body or wagon. Five large wounds were situated in the space bounded by the left ear, angle of the mouth, lower jaw, malar bone, and zygomatic arch. The largest of these wounds was half an inch in long diameter, the smallest, a quarter of an inch; the remainder were between these sizes. The edges of these wounds were slightly blackened and were sharp cut. Beside these wounds there were forty or fifty small shot wounds scattered over the left side of the face. Only one shot wound was found to the right of the median line, and that was on the forehead. Several small shot wounds were seen under the chin on the left side. No wounds were found back of the left ear on the left side of the head. The small shot cut from these wounds were number seven or number eight bird-shot.

Section of the body showed that the heart was empty and contracted; the valves and walls were normal. The lungs were non-adherent, slightly emphysematous at apices, and generally anæmic. Ordinary post-mortem staining radiated outward from the bronchi to the surface. There were no subpleural ecchymoses. The bronchi of both lungs contained coagulated blood without froth. The larynx and trachea were normal. No ecchymoses were visible, and no evidences of pressure. The tongue was brown from dried blood. The hyoid bone was uninjured. There were no marks of pressure in the structures surrounding the larynx and trachea. Two buck-shot were found lying loosely in the pharynx; they had produced no injury at the site in which they were found. The liver, spleen, pancreas, kidneys, bladder and alimentary canal were normal. The stomach contained half a pint of partly digested food, in which could be distinguished beef, fowl, bread, potato, and other matters. The small intestine was the receptacle of matters which had undergone stomach digestion. The colon contained normal fæces.

The skull was extensively fractured. The charge of shot had torn through parts of the left temporal and sphenoid bones, breaking them into fragments, and carrying them into the brain. The ascending ramus of the jaw was fractured. The body of the sphenoid was fractured. Fractures radiated in all directions from the foramen magnum. A large, transverse fracture passed through both parietals at their back part, both temporals in the petrous portion, and the basilar process of the occipital. Around the wound of exit, the occipital bone was shattered to bits. Two buck-shot were found at the wound of exit. One lay just inside the skull, and one, much flattened, was between the scalp and the skull. These buck-shot, and those found in the pharynx, were weighed, with the following result: The flattened shot weighed forty-seven grains, Troy; the others, thirty-eight and a half, forty-

one, and forty-one and a half, respectively; total, one hundred and sixty-seven grains. The left internal and external carotid and basilar arteries were torn across, and the veins at the side of the neck, and the sinuses of the skull were freely opened. The large wounds of the face communicated directly with the interior of the skull through the sphenoid and temporal bones. Three fingers could be passed from the interior of the skull through this opening into the wounded region of the face. The right posterior lobe of the cerebrum was lacerated. The cerebellum was badly torn, the left hemisphere being nearly detached, and the right much lacerated. The medulla oblongata was cut through just below the olivary bodies. The spinal cord was normal. A blood-clot extended between the dura mater and the cord, from the foramen magnum to the second lumbar vertebra. The body was generally very anæmic.

Before discussing the points arising from the view and autopsy, it may be well to give an outline of the story of the murder, as brought out by the evidence accumulated by the police, and offered at the trial of Samuel F. Besse, for the killing of the man who furnishes us with the material for this paper.

Richard N. Lawton, a quiet, inoffensive man of unexceptionable habits and character, left his home in Westport, on Monday, December 21st, 1885, to take his usual route to Wareham and back, collecting eggs. He had with him probably between two and three hundred dollars. He arrived at Wareham that evening, and was seen by various persons. He passed the night at the house of Mrs. Long, who gave him his breakfast at about 8 o'clock, A. M., Tuesday, and he then started to collect eggs. He called at a number of houses, as was his custom, and, about half-past ten, left the house of Mr. Handy to go to South Wareham by a wood-road which was uninhabited for some distance, and led past Blackmore's Pond. No one, except his murderer, ever saw him alive afterward, and the next that was known of him was the discovery of his body in Plainville, on Wednesday morning, fifteen or sixteen miles from Mr. Handy's house. Samuel F. Besse, the convicted murderer, was a desperate character, living with his father in a miserable hovel and a wretched neighborhood, in South Wareham. The locality bears the fitting name of "Hogtown." He had spent a long term in State Prison for burglary, and was a terror to the neighborhood. He knew Lawton's habits and the fact that he carried money with him, and it was known that he had contemplated robbery of this man for some time. On Tuesday morning, December 22d, he left his home about eight o'clock, taking his gun and buck and bird shot of precisely the same character as those found in Lawton's head.

He waylaid Lawton as he came down the road from Handy's, and, secreting himself in the thick bushes at the side of the road, shot him. The location was determined by finding a cushion and whip belonging to Lawton near by, and upon assuming a position which it was reasonable to suppose was Besse's at the time of firing, the direction of the charge could be traced by the cut twigs of trees and bushes, and blood scattered about. Immediately after the shooting, the horse started, but, in sheering out, brought up on a tree-stump

or log, which sprung the hind-axle. Besse caught him and turned him into the short scrub-oaks at the side of the road, and, making evidence for his conviction by scrubbing the shrubs and small trees in his haste, and leaving the marks of uneven wheels on the ground, he found a good-sized tree some distance in from the road, in an unfrequented place, and tied the animal to it. This was shown by the tree being gnawed, the ground stamped and pawed, horse-droppings lying about, and a box, completing, with those found in the wagon, the original number which Lawton had on leaving home.

A most important witness for the prosecution was one Westgate, a companion of Besse's (as far as he thought prudent to be), who, at the time of the murder, was looking after some traps on the Weweantit River, an outlet of Blackmore's Pond. He was about a quarter of a mile away through the woods. He says he heard a team coming down the road, and voices. Then he heard two shots and some shouting. He looked after a few more traps, and then made his way to the road, where he met Besse. He inquired of Besse whose team it was that passed down the road, and what he fired at. Besse replied that he had seen no team, and that he had just shot a rabbit. After a little conversation on general topics, Westgate went home, leaving Besse in the road. Besse arrived home shortly after noon, and, having made some purchases, proceeded to devote his time to drinking.

He spent the first part of the night at a neighbor's, sleeping in a chair. About 3 o'clock, A. M., Wednesday, he left the house, and, going to the place where the horse was secreted, he arranged his load, and, mounting the vehicle, urged the horse at as rapid a pace as possible through the various towns to Acushnet. As he entered Acushnet, still intoxicated, day was breaking. Several people saw him, marked his intoxication and his strange load, and one or two spoke to him. As he gained the country beyond Acushnet he met more people, and, concluding probably that the region was rather populous, he deserted the horse and wagon, and made his way through the woods and fields to New Bedford, where he was seen between eight and nine o'clock. A trifle of cunning seemed to remain in his intoxicated brain, for he went over to Fairhaven (across the river from New Bedford) to await the arrival of the morning train from the Wareham region, before showing himself publicly in New Bedford. While waiting for the street-car coming from the depot, he sat in an opening of a broken fence in a drunken sleep, and was seen by a number of passers-by. About noon he returned to New Bedford, and spent money freely for clothing, liquors, and other articles, and at four o'clock took the train to Wareham, his drunken state attracting the attention of the conductor. On Thursday night, December 24th, he was arrested at a neighbor's house on suspicion, and in a short time evidence of the most convincing character fastened the crime upon him. He was tried at a special session of the Supreme Judicial Court at Plymouth, in May, 1886, and convicted of murder in the first degree. In this brief and condensed statement of fact, no special reference is made to the large amount of testimony necessary to establish the main facts as well as those of secondary importance;

nor does the evidence concern us particularly as medical men except in so far as it has a bearing on the points having medico-legal interest.

At the preliminary hearing at Wareham, shortly after the murder, and at the hearing before the grand jury at Plymouth, the medical evidence was quite fully given. At the trial, however, very little work was given to the medical examiner. The defence admitted the cause and manner of the death without question, and the conversational powers of the witness received very little encouragement. But a very few questions involving statement of opinion were asked.

In preparation for the trial, quite a number of questions worth looking at presented themselves to my mind, and may be of interest to others.

I. How long had this body been dead when found at ten minutes past ten on the morning of December 23d? The body was not quite cold, and the only rigor mortis observed was a slight amount in the legs. According to our best authorities, the body cools in fifteen to twenty hours, the process being governed by the temperature of the surrounding medium. Under favorable circumstances it may be delayed to forty-eight hours or more. Warm weather, thick clothing or coverings, and a large quantity of subcutaneous fat favor slow cooling. Cooling is hastened by slight coverings, cold weather, leanness and death by hæmorrhage. Lawton's body was lightly covered, the clothing being open to the shirt. The temperature of the air was a little above freezing. He was not fat, and he had died with extensive hæmorrhage. And yet his body was not cold, though he must have been dead twenty-three hours when I saw him. Rigor mortis usually begins at the third or fourth hour, and is complete at the fifth or sixth. Exceptionally it may be complete as early as the second hour or as late as the thirteenth. No case has been reported in which its appearance has been delayed beyond twenty-four hours. It passes off in twenty-four to thirty-six hours in summer, thirty-six to forty-eight in winter. Exceptionally it lasts only two or three hours, and may possibly continue as long as three weeks. It appears first in the muscles of the face and neck, then in those of the trunk, and finally in the arms and legs. It passes off in the same order, the legs being the last to yield. In sudden death with no fatigue and with hæmorrhage, rigor mortis is apt to come on slowly and last a long time. This was the case with Lawton, and yet we find him lacking rigor mortis except in the lower extremities. It was reasonable to believe that rigor had come on and had been broken up by handling the body and jolting it about in the wagon. To be sure of this, I had the body carefully watched by the undertaker after it had passed from my hands. No rigor appeared. From the state of the body I did not feel warranted in approximating closely to the time of death, and gave as my opinion the statement that the body had been dead not more than thirty hours.

II. What was the cause of death? Three causes, either capable of producing death, were evident: shock, hæmorrhage, and section of the medulla oblongata. As the death was instantaneous, the last cause must have been

the most important. How do we know that his death was instantaneous? This promised to be a point of some importance, but did not come up at the trial. As far as we know of instantaneous death, section of the medulla oblongata gives us the typical example. Again, the absence of froth in the bronchi, and the undisturbed coagula therein, showed plainly the method of death. Lawton's respiration ceased instantly. The heart continued to beat and pump the blood from the body as long as any came to its cavities, and finally stopped in systole. Had he breathed after being shot, we should certainly have found frothy, bloody liquid in the air-passages.

III. Could he have died from any other cause than gunshot wound of the head? What had the rope about the neck to do with his death? Fortunately, the answer is an easy one. Not one single symptom of death by asphyxia was present. The trachea and larynx, as before stated, showed no trace of injury, unusual redness or ecchymoses. The structures of the neck were normal. No furrow was found in the skin of the neck; no froth or frothy liquid in the air passages; no congestion of the internal organs. It might be of importance to say that he was not hung first and shot afterward. Had this improbable state of things happened, we should still have had congestion of the abdominal organs, as the wounds of the head, at most, would have emptied only the vessels of the head and upper extremities. The generative organs showed no evidences of anything unusual, and the tongue was not swollen or indented. What the rope was used or intended for, must remain a sealed book, unless the convicted man sees fit to tell his story.

IV. From what direction and at what distance was the fatal shot fired? How can we connect the murderer with the missiles found in the body? The small shot wounds formed an ellipse, in the centre of which were the large wounds. These wounds were all on the left side of the face, some under the chin, but none back of the ear. The charge passed through the left temporal and sphenoid bones, along the base of the skull, and emerged a little to the right of the median line at the back of the head. It necessarily follows that the charge must have come from in front, somewhat to the left, and a little below the plane of the base of the skull. It is probable that Lawton was riding slowly along with the head slightly bent downward.

Authorities, surgical and medico-legal, are by no means agreed as to the appearances of wounds of entrance and exit. In most surgical works the dogma is maintained that the wound of entrance is always smaller than that of exit. As the other extreme we find Casper, who is equally dogmatic in the assertion that the wound of exit is always the smaller. Ogston, Taylor and Tidy recognize that many circumstances influence the appearance of these wounds, and that each case may present features peculiar to itself regarding the relative size of the two wounds, and the degree of inversion or eversion, laceration, and so on. Had any question arisen in this case, the fact that fragments of the temporal bone were found in the brain near the wound of exit would have settled the matter.

Westgate says he heard two shots. If two were fired, one only could

have struck the murdered man. I conceive it to be next to impossible for a gunner to put two charges into a moving object in exactly the same relation. Again, had the first barrel missed, the victim would certainly have been disturbed and would have changed the position of his head. With regard to the distance at which the shot was fired, I have made some experiments with an old fashioned muzzle-loading fowling-piece with very long barrels, which I knew to be capable of carrying shot very closely. In trying to obtain a powder-brand I used two and three-quarters drachms of rifle powder, at various distances. Briand and Chaudé, quoted in Medical Examiner Fish's admirable paper on pistol shot wounds,[2] state that powder-brand can be obtained at a distance equalling the length of the gun-barrel. Casper puts it at three or four feet, and Ogston, quoting Lachése, gives about the same figures. I was unable to get a powder-brand in the open air at a greater distance than two and a half feet; I certainly could not obtain one at the length of my gun-barrels, nearly three feet.

Partly burned powder would stick in bibulous paper in the open air at about eight feet; whether it would adhere to the human skin at that distance, I do not know. Wadding of good tough paper, well rammed, will be thrown twelve to fifteen feet against a slight breeze, and eighteen to twenty feet with the breeze. With my gun, loaded with two and three quarters drachms of powder, one ounce number seven bird-shot, and twelve buck-shot, I could make a target closely resembling that on Lawton's head at twenty-five feet. Besse's gun was an old-fashioned double Manton with shorter barrels than mine and would probably not carry as closely. I put his distance from Lawton, at the time of firing the fatal shot, at eighteen to twenty feet.

In Besse's game-bag were found No. 7 bird-shot and 41 buck-shot, which, it was shown, he had purchased within a few days. The buck-shot were divided into groups of four, taken at random, and weighed by Professor Babcock, of Boston, who found that the fours averaged about a hundred and seventy grains. Some fours went as low as one hundred and sixty-three grains, and one, at least, over one hundred and eighty. As before stated, the four which I removed from the head and throat weighed one hundred and sixty-seven grains. An ounce of No. 7 bird-shot I found to contain from three hundred and fifty to four hundred, which would give a plenty to make the wounds of Lawton's face, as well as to cut the twigs of the trees and bushes in the line of fire. The method of loading is characteristic of an ignorant gunner, many men of this class having a belief that buck-shot will carry closer when backed by a charge of small shot.

Certain stains were found on the front of the legs of Besse's trousers. These had been subjected to attempts at removal, but not efficiently enough to ruin them for examination. The police sent these trousers, as well as a pair of boots worn on the night of transportation of the body, to Professor Babcock, of Boston; consequently, I did not see them until the day of the trial. Pro-

[2] Transactions Mass. Medico-Legal Society. Vol. I, p. 285.

fessor Babcock was fortunate enough to obtain the articles early enough to find blood-corpuscles in the stained places, and gave the very just and scientific statement that the blood was that of a mammal, that there was nothing inconsistent in the view that it was human blood, or that it was the blood of a rabbit. Certainly, where stains are sufficiently recent, the finding of corpuscles is the most conclusive test possible. I am inclined to think, however, that the time in which corpuscles can be distinguished in a blood-stain is shorter than is generally supposed, and I should place little reliance on observations made beyond a week or ten days. Some difference of opinion exists between authorities as to the value of the spectroscope in examination of blood-stains. Tidy is very enthusiastic in its favor, considers it infallible, and claims to have produced a characteristic spectrum from a stain known to be over one hundred years old. Others are more conservative, and still others assert that it is inapplicable in very many cases, requiring a good deal of technical skill, and, even in the best hands, proving unsatisfactory. I am not prepared to accept this last view. What little work I have had opportunity to do with blood has prepossessed me in favor of spectrum analysis, and, as it seems the only certain test, where it *is* clear and unmistakable, I think that hard work is well repaid which renders a man familiar enough with blood-spectra to be certain of their recognition.

Perhaps the best method to pursue with a bloodstain on cloth is that proposed by Ogston, which I will quote, with slight modification:

"The stained portion of the cloth is to be cut out and suspended by a fine thread in a test-tube containing distilled water. If the stain is from blood, the coloring matter will detach itself from the cloth in the form of reddish striæ, and collect at the bottom of the tube, while the water will there assume a red color, more or less pronounced.

"(1) A portion of the contents of the tube may now be used for the spectroscope.

"(2) Two or three drops of the fluid from the bottom of the tube may be cautiously withdrawn by a pipette, and examined under the microscope for blood-disks, epithelial-scales, or fragments of capillary-tubes.

"(3) Two or three more drops similarly withdrawn from the bottom of the tube may be placed on a slide, glacial acetic acid and a very minute crystal of common salt added, left to spontaneous evaporation, or gently heated, and when dried, examined by the microscope for crystals of hæmatin.

"(4) A little of the fluid may be dropped on bibulous paper and submitted to the guaiacum test.

"(5) A little more of the fluid, after the addition of ammonia, may be watched for any change other than a heightening of its color. If the red color comes from vegetable matters, it will be changed to blue, green, and so on.

"(6) The remainder of the fluid in the tube may be now heated, without or with nitric acid, for albumen, which, if present, will render it milky, or throw

down a coagulum from it of a dirty gray color, leaving the water without a trace of red.

"(7) The turbidity or coagulum, if from albumen, will disappear or be re-dissolved on the addition of caustic potassa, and assume a brownish-red by reflected, and a green color by transmitted light.

"(8) When the stain has arisen from a layer of blood of perceptible thickness, the cloth, after the maceration, may exhibit a soft, white, grayish or rosy adherent matter, which, when removed and placed under the microscope, will prove to be the fibrin of the blood."

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